

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-17 (cancelled)

Claim 18 (new)      A node device in an optical network system, the node device functioning as one of a start point node, an end point node, and an intermediate node which locates between said start point node and end point node, said start point node, end point node, and intermediate node having an optical path to be set in said optical network system, the node device comprising:

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a connection information responding means for inquiring a second node device adjacent to a self node device about connection information of said second node device and connection information of a third node device adjacent to said second node device each time a predetermined time is elapsed or a predetermined event is generated, responding with the connection information of the self node device and the connection information of a fourth node device adjacent to the self node device if the self node device receives inquiry about connection information of the self node device from the second node device, and storing the connection information of said second node device and the connection information of said third node device acquired from said second node device; and

an optical path setting means for setting an optical path which cuts through a higher layer of said self node device based on the connection information of each node device acquired using

said connection information responding means when said node device functions as said intermediate node.

Claim 19 (new)      The node device according to Claim 18, further comprising:

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a cut-through optical path determination means for determining the necessity of a cut-through in said optical path setting means of any one of the second, third, or fourth node devices which function as said intermediate node based on the connection information of each one of said node devices, stored by said connection information responding means of said node device when said device functions as said start point node, and instructing the setting of said cut-through optical path to any one of said second, third, or fourth node devices for which said cut-through is determined as necessary.

Claim 20 (new)      The node device according to Claim 18, further comprising:

an information channel insuring means for determining whether the node device for which setting of said cut-through optical path is instructed can insure the information channel even after the setting of the cut-through optical path, and setting said cut-through optical path only when said information channel can be insured.

Claim 21 (new)      A node device comprising:

a router for receiving a transfer packet based on header information and determining an output

destination of the transfer packet;

an optical cross-connect having optical switches for setting optical paths between input/output optical fibers by one of extracting optical signals from an optical fiber, inserting optical signals into an optical fiber, and relaying optical signals from input fibers to output fibers; and

a node control device according to claim 18 for switching a route of the optical paths using the optical switches according to instructions of the received transfer packet or based on self judgment.

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Claim 22 (new) The node device according to claim 21, further comprising:

a switch for connecting a destination-based buffer to at least one output of the router to said optical cross-connect, and for connecting a packet read from said destination based buffer to an input port of the optical cross-connect.

Claim 23 (new) The node device according to claim 22, further comprising:

an allowable delay recognition function means at said router for determining the allowable delay of a transfer packet for direct output of said transfer packet to one of the optical cross-connect and destination-based buffer according to one of the allowable delay and a packet loss ratio.

Claim 24 (new) A node device comprising:

a router for receiving a transfer packet based on header information of a higher layer and determining an output destination of the transfer packet;

an optical cross-connect for setting an optical path between input/output optical fibers by one of extracting optical signals from an optical fiber, inserting optical signals into an optical fiber, and relaying optical signals;

a node control device according to claim 18 for switching the direction of said optical cross-connect according to instructions of the received transfer packet or based on self judgment; and

an optical path extraction/insertion means for one of extracting optical signals with a wavelength insured for an information channel from the optical fiber, and inserting the optical signals into the optical fiber for communicating information signals with another node device.

Claim 25 (new) A node device comprising:

a router for receiving a transfer packet based on header information and determining an output destination of the transfer packet;

an optical cross-connect for setting an optical path between input/output optical fibers by one of extracting optical signals from an optical fiber, inserting optical signals into an optical fiber, and relaying optical signals;

a node control device according to claim 18 for switching the direction of said optical

cross-connect according to instructions of the received transfer packet or based on self judgment;  
and

a pilot tone signal super-imposing/receiving means for one of super-imposing pilot tone signals for an information channel on an optical path for user data, and separating pilot tone signals for the information channel from the optical path for communicating information signals with another node device.

Claim 26 (new)      The node device according to claim 25, wherein the pilot tone signals for the information channel are transmitted by a time division multiplex system.

Claim 27 (new)      An optical network system comprising a plurality of node devices according to claim 4.

Claim 28 (new)      An optical path setting method in an optical network system having a plurality of node devices, wherein each node device functions a one of a start point node, an end point node, and an intermediate node which locates between said start point node and end point node, said start point node, end point node, and intermediate node constituting said optical path to be set in said optical network system, the method comprising the steps of:

each one of said node devices inquiring a second node device adjacent to a self node device about the connection information of said second node device and the connection

information of a third node device adjacent to said second node device each time a predetermined time is elapsed or a predetermined event is generated, and responding with the connection information of the self node device and the connection information of a fourth node device adjacent to the self node device when the self node device received said inquiry from said second node device; and

setting an optical path which cuts through the higher layer of the node device which the self node device controls, based on the connection information of each node device acquired by said inquiring and responding step when the self node device functions as said intermediate node.

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Claim 29 (new) The optical path setting method according to claim 28, further comprising the steps of:

determining whether the node device for which setting of the cut-through optical path is instructed can insure the information channel even after the setting of the cut-through optical path, and

setting said cut-through optical path only when said information channel can be insured.

Claim 30 (new) The optical path setting method according to claim 28, further comprising the steps of:

reading a packet from the destination-based buffer; and

transmitting the packet to the cut-through optical path after setting.

Claim 31 (new)      The optical path setting method according to claim 30, further comprising the step of:  
storing the packets in said destination-based buffer based on one of an allowable delay time and a packet loss ratio.

Claim 32 (new)      The optical path setting method according to claim 28, further comprising the step of:  
communicating between the node devices where the cut-through optical path is set; and  
using optical signals with a wavelength insured for an information channel after said cut-through optical path is set.

Claim 33 (new)      The optical path setting method according to claim 28, further comprising the step of:  
communicating between the node devices where the cut-through optical path is set; and  
super-imposing pilot tone signals for an information channel on the optical path for user data even if said cut-through optical path is set.

Claim 34 (new)      The optical path setting method according to claim 33, wherein the pilot tone signals for the information channel are transmitted by a time division multiplex

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